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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/665,229

09/18/2000

John M. Slater

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09/21/2004

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EXAMINER

DANG, HUNG Q

ART UNIT

PAPER NUMBER

2635

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	09/665,229	SLATER ET AL.	
	Examiner	Art Unit	
	Hung Q Dang	2635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2004.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☒ Claim(s) 1-8, 11-29 and 42-62 is/are allowed.
 6) ☒ Claim(s) 30, 34-39 and 63-68 is/are rejected.
 7) ☒ Claim(s) 63 is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to applicant's amendment received on 7/19/2004. The amended claims 1, 16, 17, 20, 27, 29, 30, 34, 35, 37, 39, 42, 47, 53, 62 and the canceled claims 9, 31, 32, 40, 41 and the added claims 63-68 have been entered.

Claim Objections

2. Claim 63 is objected to because of the following informalities: the word "confugred" should be changed to "configured". Appropriate correction is required.

Response to Arguments

3. Applicant's arguments with respect to claims 1, 20, 40, 47, 53 and 62 have been fully considered and are persuasive because the indicated claims contain allowable subject matter from claim 9. The rejections of claims 1-8, 11-29 and 42-62 have been withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 30, 35 and 63-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirsch U.S. Patent 4,396,149 in view of Schuermann et al. U.S. Patent 5,053,774.

Regarding claims 30 and 35, Hirsch teaches a probe (Figure 3 unit 17) for use in conjunction with a reader to facilitate measurement of moisture content of soil comprising:

A body (Figure 3, unit 17);

At least one electronic circuit (Figure 3, unit 32) attached to said body and configured for operative communication with the soil, said at least one electronic circuit consisting of a moisture sensing capacitor (column 6, lines 1-10) for measuring at least one moisture parameter of said at least one soil medium and transmit at least one data signal corresponding to said at least one moisture parameter, said at least one data signal being received by said reader (column 2 lines 1-12).

However, Hirsch does not teach that said reader transmits at least one excitation signal having at least an energy component to said at least one probe, said at least one probe using said energy component of said excitation signal to induce the electronic circuit to resonate substantially near a resonant frequency of the electronic circuit, the resonant frequency being a data signal transmitted to the reader indicating the moisture content of the soil.

Schuermann et al. teaches a probe for use in conjunction with a reader to facilitate measurement of a medium of interest, wherein said reader transmits at least one excitation signal having at least an energy component to said at least one probe, said at least one probe using the received excitation signal to induce said electronic circuit to resonate so that said data signal transmitted by said at least one electronic

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circuit has a frequency substantially equal to a resonant frequency of at least a portion of said at least one electronic circuit (column 8 lines 1-5 and column 9 lines 55-65).

Since one skilled in the art would recognize that such probe would need some sort of power source in order for it to transmit sensed data. Apparently, using solar source (disclosed by Hirsch) and inductive powering (disclosed by Schuermann et al.) to provide power for a device has been conventionally done. Furthermore, inductive powering and using solar as a source of power both help energy conservation. Therefore, it would have been obvious to one of ordinary skill in the art to alternatively provide the inductive power method disclosed by Schuermann et al. to the probe disclosed by Hirsch in order to transmit sensed data to a reader.

Claims 63-65, 67 and 68 are rejected for the same reasons as claim 30.

Regarding claim 66, the moisture parameter disclosed by Hirsch does comprise soil matrix water potential.

6. Claims 34 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirsch in view of Schuermann et al. U.S. Patent 5,053,774 and in further view of Iltis U.S. Patent 4,683,904.

Regarding claim 34, as mentioned above, Hirsch in view of Schuermann et al. teaches a probe having a moisture sensing capacitor, which as capacitance varies according to the moisture content of the soil, and an electronic circuit resonates so that the data signal is transmitted at a frequency equal to a resonant frequency of said electronic circuit. However, Hirsch in view of Schuermann et al. does not specifically

suggest that the resonant frequency of said electronic circuit is primarily determined by the capacitance of said moisture sensing capacitor.

Ittis also teaches an irrigation control system, which includes a moisture sensing capacitor having a capacitance, which varies according to the moisture content of the soil, and the frequency of the oscillations changes as the capacitance changes (paragraph bridging columns 2-3 and abstract).

Since Ittis teaches data signal having frequency changing depending on the capacitance of the moisture sensing capacitor and Hirsch in view of Schuermann et al. suggests transmitting soil moisture data signal at a resonant frequency resonated by an electronic circuit in the probe having capacitance varies according to the moisture content of the soil, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide transmitting moisture data signal at a resonant frequency determined by the capacitance of the moisture sensing capacitor disclosed by Hirsch in view of Schuermann et al., as suggested by Ittis, in order to optimally transmit said soil moisture data signal.

Claim 36 is rejected for the same reasons as claim 34.

Regarding claims 37 and 38, apparently the moisture sensing capacitor disclosed by Hirsch comprises a hydrophilic dielectric in order to sense moisture.

Regarding claim 39, as mentioned above, Hirsch in view of Schuermann et al. teaches a system as claimed in claim 39. However, Hirsch in view of Schuermann et al. does not teach said sensing capacitor has a capacitance, which varies according to the moisture content of the soil.

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Ittis, in the same field of endeavor, teaches an irrigation control system, which includes a sensing capacitor having a capacitance, which varies according to the moisture content of the soil, and the frequency of the oscillations changes as the capacitance changes (paragraph bridging columns 2-3 and abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a sensing capacitor has a capacitance, which varies according to the moisture content of the soil, to the irrigation system disclosed by Hirsch in view of Schuermann et al., as evidenced by Ittis, in order to measure and transmit the moisture level of the soil.

Allowable Subject Matter

7. Claims 1-8, 11-29 and 42-62 are allowed.

Regarding claims 1, 20, 40, 47, 53 and 62, the prior arts of record fail to teach or disclose a data acquisition and telemetry system as claimed in claim 1 comprising at least one probe configured for communication with at least one soil medium; and a reader; said reader configured for transmitting at least one excitation signal having at least an energy component to said at least one probe and including blocking circuitry for substantially preventing the at least one excitation signal from being received by the reader.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Q Dang whose telephone number is (571) 272-3069. The examiner can normally be reached on 9:30AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Horabik can be reached on (571) 272-3068. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

H D

MICHAEL HORABIK
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